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MINERALS PROGRAM  
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**BARRICK**

**BARRICK RESOURCES (USA), INC.**

11/045/012  
**RECEIVED**  
FEB 10 1991

DIVISION OF  
OIL, GAS & MINING

January 31, 1991

State of Utah Department of Health  
Bureau of Water Pollution Control  
288 North 1460 West  
P.O. Box 16700  
Salt Lake City, Utah 84116-0700

Attn: Mr. Don Ostler, P.E.  
Executive Secretary

Dear Mr. Ostler:

Subject: Response to Bureau's  
November 26, 1990 Comments On The  
June 12, 1990 Report "Hydrogeology  
Studies, Dump Leach Area #2 And  
Tailings Impoundment, Barrick Mercur  
Gold Mine, Utah"

Attached are responses to your review comments (letter of November 26, 1990 from Don Ostler to Mr. Wicks) on the June 12, 1990 report "Hydrogeology Studies Dump Leach Area #2 And Tailings Impoundment, Barrick Mercur Gold Mine, Utah, For Barrick Resources (USA), Inc." As indicated in our responses, because we believe well MW-9 provides a reasonable monitoring point in the uppermost bedrock aquifer, and because there is no evidence of ground water contamination from Dump Leach Area #2, we do not believe that additional ground water monitoring should be required.

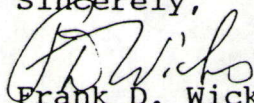
As you have indicated in your letter, your comments regarding the tailings pond will be considered in the hydrogeologic study for



Mr. Don Ostler, P.E.  
State of Utah Department of Health  
January 31, 1991  
Page 2

the ground water quality discharge permit for the tailings pond. If you have any questions, please contact me. We would like to meet with your staff regarding the comments and responses as soon as possible to try to resolve any questions or concerns.

Sincerely,



Frank D. Wicks

Vice President & General Manager

#### Attachments

cc: D. R. Bird (PB&L)  
T. D. Vandell (Dames & Moore)  
Grant Bagley (Assistant Attorney General)  
Ken Alkema (Director, D.E.H.)  
Stephen Matern (Tooele County Health)  
Wayne Hedberg (DOGM)  
Ken Bousfield (BDW&S)  
Glade Shelley (Utah County Health)

Responses to the WPCG letter of November 26, 1990

1. a) Water levels in MW-5 and MW-7 (measured at 7017.03 feet msl in MW-5 on 7/26/90, and at 7019.8 feet msl in MW-7 on 10/22/90) are above the elevation of the current operating fluid head in Dump Leach Area #2 (about 6982 feet msl). The average operating head during the life of the facility was about 40 feet above the base, or about 7001.5 feet msl. The maximum head, has in the past, been as high as 69.5 feet or 7031 feet msl which would have been greater than the water elevations in MW-5 and MW-7. These two shallow wells do provide valuable ground water quality and elevation data for the shallow alluvial aquifer adjacent to, and east and topographically downgradient from the dump.

The shallow wells were completed through the alluvium to the top of limestone in MW-5 and to the top of the shale in MW-7. The base of the well screens are below the current fluid operating head. The screens are 20 feet long, extending from elevation 6983.96 to 7003.96 feet msl in MW-5, and from 6976.05 to 6996.05 feet msl in MW-7. These well locations and completions were discussed with the Bureau prior to and during drilling. It was agreed that the wells were to be completed in the first water-bearing zone encountered.

1. b) Existing hydrogeologic data are frequently used to evaluate flow directions and water quality. The historic on-site water level elevation data and regional hydrogeologic data indicate that the flow direction is primarily to the east and ultimately to the southeast towards Cedar Valley. Although the current ground water monitoring well network at Dump Leach Area #2 may not meet specifications for detailed ground water compliance monitoring in accordance with the State of Utah Ground Water Quality Protection Regulations, it is our understanding that a ground water discharge permit is not required for this facility because it is an existing facility, active leaching is scheduled to cease in early to mid-1991 and there is no indication of ground water contamination from Dump Leach Area #2 (see January 2, 1991 letter from Barrick to the Bureau regarding the Notice of Violation for Area #2). Well MW-9 is completed in the deep

bedrock aquifer in the Great Blue Limestone. This is a strategic location, immediately to the southeast of Dump Leach Area #2. The water level in this well was measured at 922.83 feet below ground surface (6152.21 feet msl) on 10/24/90. Water quality data have been supplied to the Bureau and do not indicate contamination.

1. c) Piper and Stiff diagrams and tables showing average percentages of major ions for MW-8 and TMW-2 are attached. As shown, the ground water in MW-8 appears to be predominately a calcium-bicarbonate water, with calcium accounting for 72 percent of the cations and bicarbonate about 69 percent of the anions. The water in TMW-2 is a mixture, with the major ion percentages nearly equal. Data summaries (percent anions and cations) are also attached.

Water quality differences are not unusual for such a low permeability formation which varies greatly in depth as at the site. The difference in the water quality in these wells is likely due to the large difference in depth and distance to outcrop, differences in saturated thickness, localized differences in lithology, and resultant differences in water quality as water moves through the formation. Well MW-8 penetrates the full thickness of the Medial Limestone. The limestone penetrated by MW-8 (of which about 5 feet is saturated), is screened from 247.2 feet to 300 feet. Based on the static water level of 290.58 feet measured on 11/27/90, there was only about 9.42 feet of standing water in the well and as of December 1990 this well does not yield enough water to sample. When MW-8 is sampled, only one casing volume (about 10 gallons) can be removed with subsequent well dewatering. In contrast, well TMW-2 penetrates about 200 feet of Medial Limestone, was drilled to 1,280 feet and cased to 1,120 feet. The static water level in TMW-2 was measured at 179.41 feet on 11/30/90. Well TMW-2 yields significantly more water than MW-8. Well TMW-2 is typically pumped at about 19 gpm and had a sustained yield of 20 gpm for 3 hours.

The vertical hydraulic gradient and flow direction in the Medial Limestone will be considered in evaluating the adequacy of ground water compliance monitoring points for the tailings pond.

2. a) The tailings pond water is a sodium-sulfate type water, based upon the attached data.

2. b) This is correct. The tailings pond water (which is a process water) also exceeds the Ground Water Quality Standards (as per the State of Utah Ground Water Quality Protection Regulations, August 1989) for pH, fluoride, lead, and mercury.

2. c) Cyanide is a key indicator of seepage from dump leaching and has been reviewed consistently in conjunction with the other key indicator parameters (sulfate, chloride and sodium). However, cyanide compounds have been analyzed to be at or below detection limits for Tailings Pond and Dump Leach Area #2 wells. Therefore, cyanide was not considered useful for analysis of mining impacts at the time of this report.

2. d) See 1.c) above.

2. e) This is correct. Nitrite was not analyzed.

3. a) The geology and historic water level data indicate that the regional ground water flow direction is to the east and ultimately to the southeast. All of the available historic water level elevation data from the previous borings completed into the Long Trail Shale ( a total of 10 borings drilled in the early to mid 1980's) were considered when approximating the hydraulic gradient and direction of ground water flow near Dump Leach Area #2. Note that Well MW-9 is east and southeast of Dump Leach Area #2.

3. b) Based on the water quality data from MW-9 (which is located adjacent to and in a strategic location with respect to Dump Leach Area #2), there is no evidence that the ground water quality has been impacted. We believe that additional monitor wells are not needed. (See also response to Item 1.b).

4. a) The geophysical logs are reliable for the purposes for which they are intended: interpretation, in conjunction with all data, of hydrogeologic and lithologic conditions in the subsurface. Geophysical logs should be interpreted



collectively on the basis of a thorough understanding of the principles and limitations of each type of logging technique and knowledge of the geohydrologic environment under study (Keys and MacCary 1985). Geophysical interpretations of lithologic units were based upon evaluation of drill cuttings taken every 10 feet, drilling characteristics, and supporting electrical and nuclear borehole geophysical logs.

Geophysical logging runs were made in accordance with standard practices in the industry. Density tool runs were made in conjunction with a caliper tool. However, the geophysical contractor was unable to open the caliper on the tool during logging of MW-8 due to equipment malfunction. Two attempts were made to correct the problem by retrieving the tool from depth. Therefore, the data from the density logging run on MW-8 is not reliable for quantitative analysis (i.e., measure porosity). The data can be used to qualitatively evaluate lithologic contacts and subsurface conditions.

As is standard practice by Century Geophysical, the neutron tool was not run in conjunction with a caliper. Neutron "porosity" logs are useful in both large and small diameter borings. The radius of investigation for the neutron tool has conservatively been estimated at ranges of 6 inches to 2 feet, greater than the reported 6-inch radius of investigation for gamma-gamma density tools. Extraneous effects on neutron logs (as most logs) are generally induced by changes in boring diameter. Most porosity logging tools are omnidirectional devices that ride the wall of the borehole by gravity. During downhole logging, it is important that the probe does not "float away" from the borehole wall as a result of the Bernoulli effect. Such tool floating is a concern in any borehole whose deviation is less than 2 degrees (Hallenburg, 1983). Based upon drilling and well construction observations for these two deep borings, deviations were greater than 2 degrees in each case. Appropriate logging rates were maintained to allow the tool to ride the borehole wall. Log comparison of decentralized neutron versus non-decentralized neutron tools are illustrated in Keys and MacCary (1985, page 74). Both neutron logs compare very favorably with minor extraneous effects noticeable in washed-out zones. As with any geophysical log, wash-out zones must be considered and will usually prevent quantitative analysis. Qualitative interpretation is generally still possible.

4. b) As indicated previously, Well MW-8 was screened throughout the entire aquifer thickness. There was about 15.21 feet of standing water in the well after well completion. The Medial Limestone extends over a 35 foot zone, from 255 to 290 feet. As indicated, 52.8 feet of screen was installed, the lower 12.8 feet of which intercept shale and shaley limestone to 300 feet.

A slug test rather than an aquifer pumping test was conducted due to the very low well yield and dewatering of the well that results from pumping. A pumping test could not reasonably be performed on the well.

The slug test methodology is reasonable in the given circumstance. Well MW-8 is not partially penetrating. Although the ground water in MW-8 might be considered unconfined, a water table aquifer usually acts as a confined aquifer over early time periods as recognized by Boulton (1963) (see Prickett, 1965; Walton, 1970). We believe this test provides a reasonable estimate of transmissivity.

4. c) 1. No data evaluations of recovery data were presented in the subject report. The recovery water level data from the aquifer pump tests for well MW-5 and wells MW-7 and MW-9 have been evaluated and transmissivity calculations performed. Revised Tables A-21, A-22, A-23, and A-25, and Plates A-12 through A-14, are included. Values for transmissivity and permeability based on evaluation of the recovery data are very similar to those previously computed based on pumping drawdown data (see Table A-25).

The recovery data for well MW-5 plot nearly as a straight line for the later data, for  $T/T' > 10$ . However, it is not uncommon to find that a change in the slope occurs between the early (between 1 and 10 minutes) and later draw-down and recovery water level data plotted on semi-log paper. The effects of well casing storage can impact early drawdown and recovery data. It is important when analyzing aquifer pump test data by the straight line method of Cooper and Jacob (1946), that the  $u$  assumption ( $u < .01$ ) is met, (where  $u = r^2S/4Tt$ ). Due to the small values for  $r$  at the above pumped wells, this assumption is generally met for  $t$  values greater than 1 to 10 minutes.

4. c) 2. Well MW-9 intercepts the upper part of the Long Trail Shale at a depth of about 1095 feet. The Long Trail Shale at the location consists of shale, shaley limestone, and limestone with many interbeds of shale. Because ground water was not encountered until a depth of about 1175 feet (see Table A-9), as shown on Plate A-6 and as described on the geologic log, this well was completed in the Long Trail Shale member in saturated shaley limestone. We expect that the well intercepts sufficiently locally confined beds to reasonably calculate permeability values.



#### REFERENCES

- Boulton, N.S., 1963. Analysis of data from non-equilibrium pumping tests allowing for delayed yield from storage: Inst. Civil Engineers Proc. [London], v.26, p.469-482.
- Hallenburg, 1983. Geophysical Logging For Mineral Engineering Applications. Penwell Books, pp 146-153.
- Keys and MacCary, 1985. Application of Borehole Geophysics to Water-Resources Investigations - USGS Techniques of Water Resources Investigations.
- Prickett, T.A., 1965. Type-Curve Solution to Aquifer Tests Under Water-Table Conditions, Ground Water, Vol. 3, No. 3.
- Walton, W.C., 1970. Ground Water Resource Evaluation. McGraw Hill Book Company.

# PIPER DIAGRAM COORDINATES-IN PERCENT

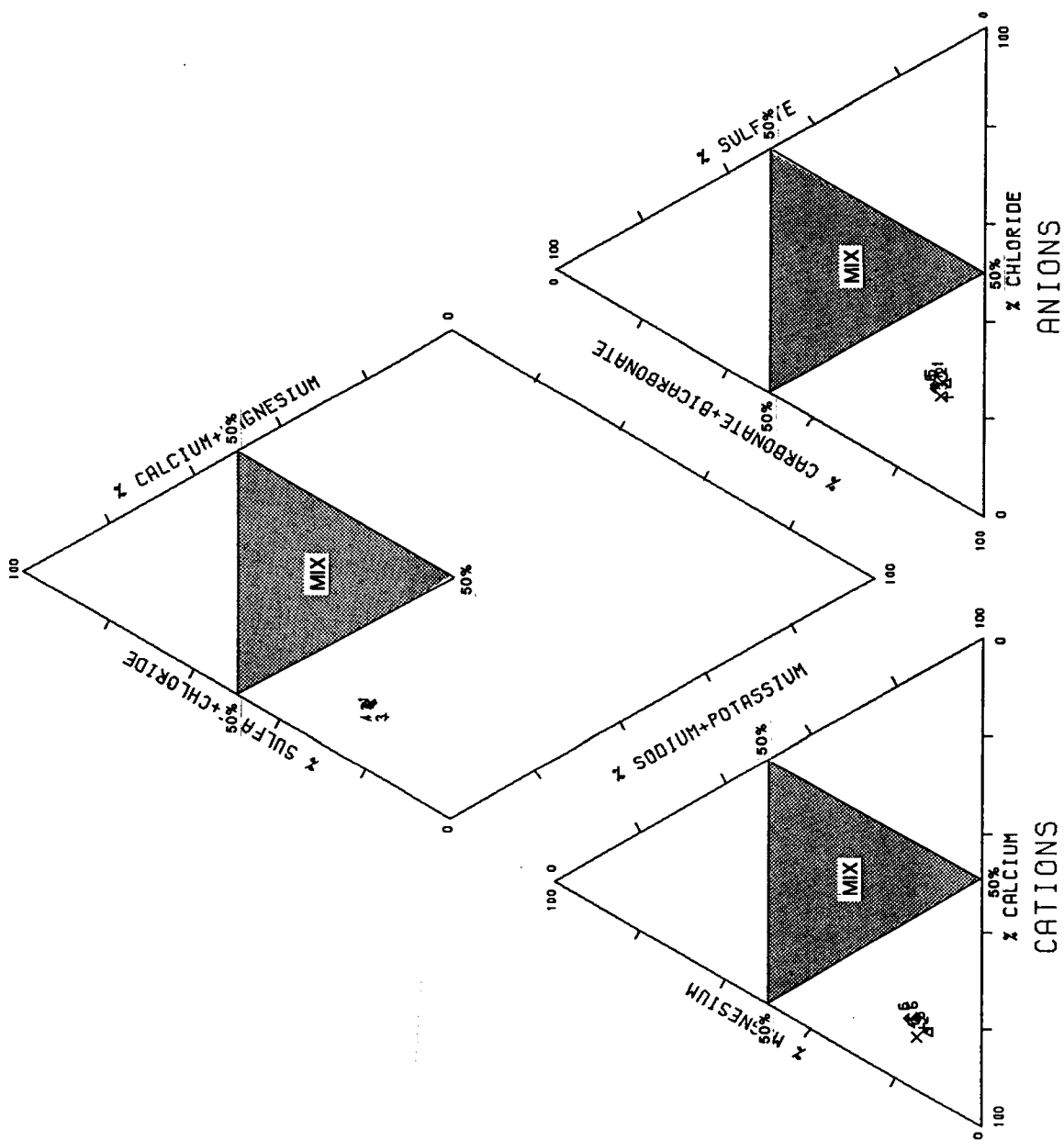
| NO. | WELL      | Ca   | Mg   | K+Na | SO4  | Cl*  | CO3+HCO3 | ION<br>BALANCE | SYMBOL |
|-----|-----------|------|------|------|------|------|----------|----------------|--------|
| 1   | MW-8:0790 | 70.5 | 15.3 | 14.2 | 9.8  | 23.9 | 66.3     | 4.5            | 1      |
| 2   | MW-8:0890 | 74.4 | 12.6 | 13.0 | 9.0  | 22.9 | 68.1     | 4.8            | 2      |
| 3   | MW-8:0990 | 73.1 | 13.6 | 13.4 | 8.7  | 19.9 | 71.5     | .6             | 3      |
| 4   | MW-8:0990 | 74.4 | 15.0 | 10.6 | 10.1 | 19.4 | 70.5     | -2.8           | 4      |
| 5   | MW-8:1090 | 70.1 | 15.1 | 14.8 | 11.6 | 21.1 | 67.3     | -4.4           | 5      |
| 6   | MW-8:1090 | 69.4 | 17.1 | 13.5 | 11.5 | 20.3 | 68.2     | .2             | 6      |

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 \*Cl INCLUDES NO3 AND F

Average Percentages of  
 Key Ions

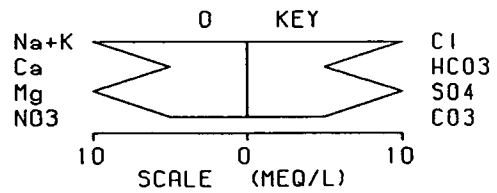
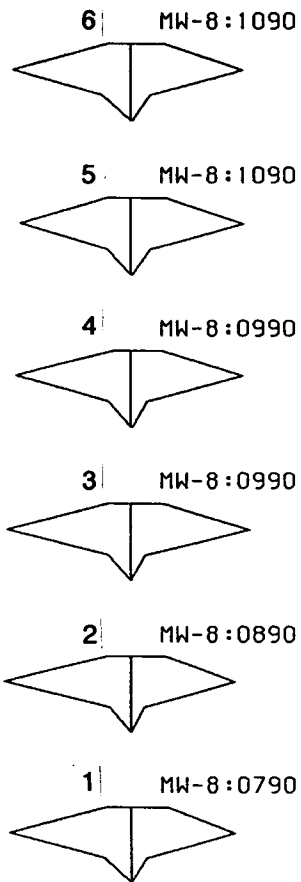
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 -----  
 -----  
 -----  
 -----  
 72      14.8      13.3      10.1      21.3      68.7

SAMPLES:  
 ○ 1 MW-8:0790  
 △ 2 MW-8:0890  
 + 3 MW-8:0990  
 × 4 MW-8:0990  
 ◇ 5 MW-8:1090  
 + 6 MW-8:1090



PIPER DIAGRAM  
 MW-8





# **STIFF DIAGRAM MW-8**

NO. WELL

PIPER DIAGRAM COORDINATES-IN PERCENT

| NO. | WELL       | Ca   | Mg     | K+Na | SO4  | Cl*  | CO3+HCO3 | ION<br>BALANCE | SYMBOL |
|-----|------------|------|--------|------|------|------|----------|----------------|--------|
| 1   | TMW-2:0383 | 37.8 | .8(1)  | 61.4 | 70.6 | 10.5 | 18.9     | -.6            | 1      |
| 2   | TMW-2:0483 | 45.1 | 2.4(1) | 52.5 | 36.6 | 53.2 | 10.2     | -4.8           | 2      |
| 3   | TMW-2:0483 | 60.0 | 17.5   | 22.5 | 22.4 | 32.9 | 44.7     | 28.2(2)        | 3      |
| 4   | TMW-2:0683 | 30.3 | 24.6   | 45.1 | 21.3 | 31.3 | 47.3     | -.1            | 4      |
| 5   | TMW-2:1083 | 55.5 | .1(1)  | 44.4 | 40.7 | 58.9 | .4(1)    | 7.9(2)         | 5      |
| 6   | TMW-2:0184 | 17.9 | 23.6   | 58.5 | 15.4 | 32.3 | 52.3     | .9             | 6      |
| 7   | TMW-2:0684 | 37.1 | 27.3   | 35.6 | 20.2 | 32.0 | 47.8     | .0             | 7      |
| 8   | TMW-2:1084 | 42.4 | 29.3   | 28.3 | 23.9 | 32.5 | 43.6     | -3.7           | 8      |
| 9   | TMW-2:0485 | 33.4 | 35.3   | 31.3 | 26.9 | 32.7 | 40.4     | -4.9           | 9      |
| 10  | TMW-2:1185 | 32.7 | 34.7   | 32.5 | 26.6 | 16.8 | 56.6     | -8.3(2)        | 10     |
| 11  | TMW-2:0186 | 37.9 | 32.7   | 29.4 | 26.2 | 36.5 | 37.3     | -14.9(2)       | 1      |
| 12  | TMW-2:0486 | 29.4 | 22.5   | 48.2 | 19.8 | 37.1 | 43.2     | 3.4            | 2      |
| 13  | TMW-2:1086 | 33.5 | 35.4   | 31.0 | 21.9 | 40.9 | 37.3     | 1.0            | 3      |
| 14  | TMW-2:0387 | 36.0 | 36.7   | 27.3 | 26.2 | 36.6 | 37.3     | -2.5           | 4      |
| 15  | TMW-2:0687 | 27.6 | .0(1)  | 72.4 | 28.8 | 55.6 | 15.7     | 5.6(2)         | 5      |
| 16  | TMW-2:0987 | 39.9 | 31.7   | 28.4 | 25.8 | 36.3 | 37.9     | 1.1            | 6      |
| 17  | TMW-2:0188 | 36.7 | 35.8   | 27.5 | 27.8 | 40.0 | 32.3     | 4.5            | 7      |
| 18  | TMW-2:0488 | 37.2 | 36.3   | 26.5 | 40.8 | 36.2 | 23.0     | 1.8            | 8      |
| 19  | TMW-2:0988 | 39.5 | 32.4   | 28.1 | 45.2 | 38.9 | 15.8     | .1             | 9      |
| 20  | TMW-2:0289 | 15.1 | 22.9   | 61.9 | 16.0 | 35.6 | 48.4     | 1.2            | 10     |
| 21  | TMW-2:0989 | 29.5 | 44.9   | 25.5 | 26.0 | 36.0 | 38.0     | -.9            | 1      |
| 22  | TMW-2:0190 | 19.7 | 28.4   | 51.9 | 35.3 | 35.2 | 29.5     | .3             | 2      |
| 23  | TMW-2:0490 | 29.4 | 37.9   | 32.6 | 28.4 | 37.9 | 33.7     | .4             | 3      |
| 24  | TMW-2:0590 | 34.9 | 34.1   | 31.0 | 23.8 | 40.6 | 35.6     | 2.9            | 4      |
| 25  | TMW-2:079  | 27.5 | 38.1   | 34.4 | 26.4 | 31.4 | 42.2     | 4.5            | 0      |
| 26  | TMW-2:089  | 36.3 | 34.9   | 28.8 | 27.1 | 35.5 | 37.4     | 1.5            | 0      |
| 27  | TMW-2:099  | 33.8 | 34.2   | 31.9 | 25.9 | 35.3 | 38.8     | -4.1           | 0      |
| 28  | TMW-2:099  | 32.6 | 32.3   | 35.1 | 30.2 | 38.6 | 31.2     | 3.0            | 0      |
| 29  | TMW-2:109  | 31.4 | 31.9   | 36.6 | 23.0 | 37.8 | 39.2     | -3.6           | 0      |
| 30  | TMW-2:109  | 35.0 | 34.1   | 30.9 | 26.1 | 36.7 | 37.2     | -1.3           | 0      |

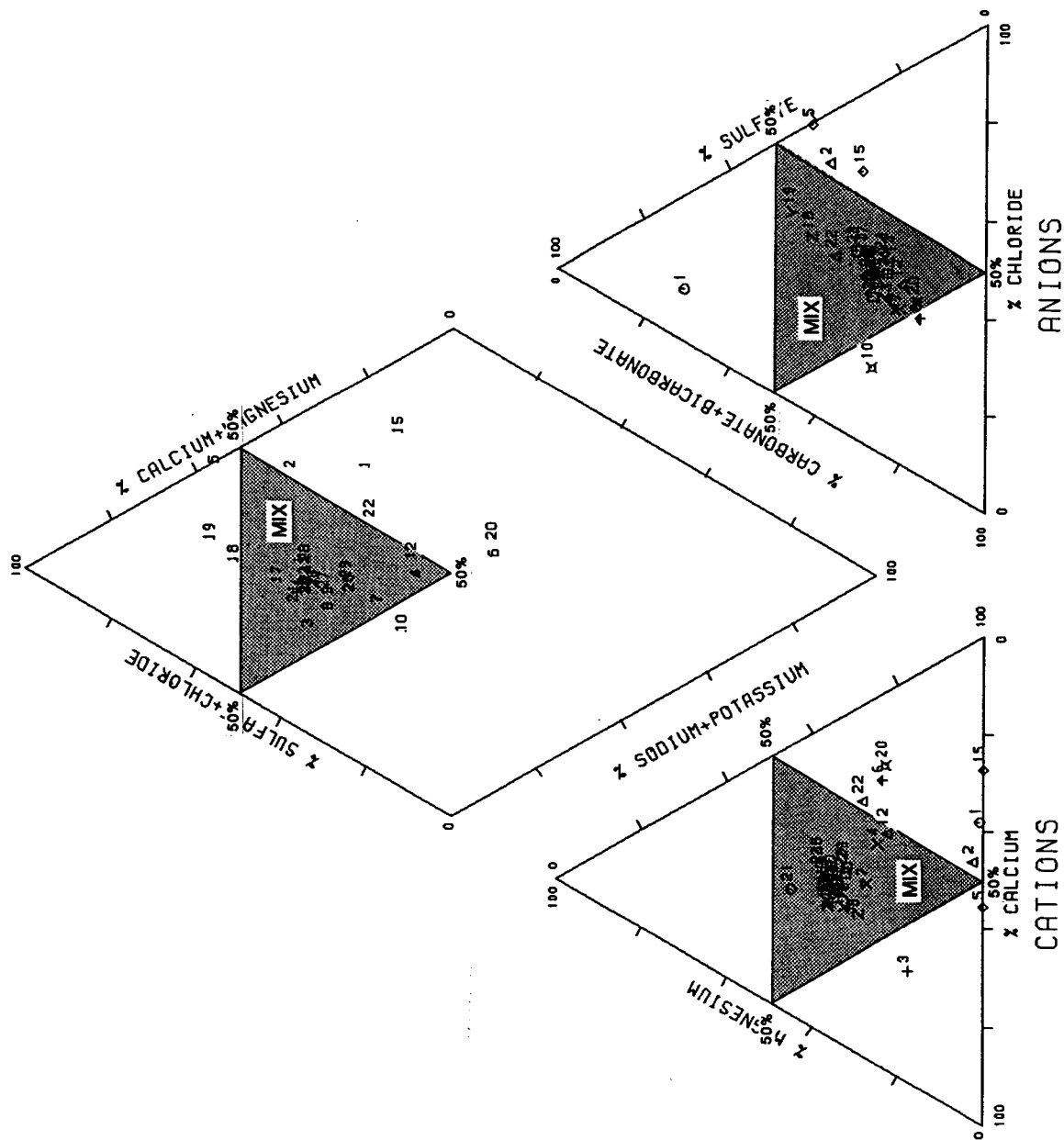
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\*Cl INCLUDES NO3 AND F

(1) Value Questionable

(2) Ion Balances  $\geq 5$

Average Percentages of  
Key Ions

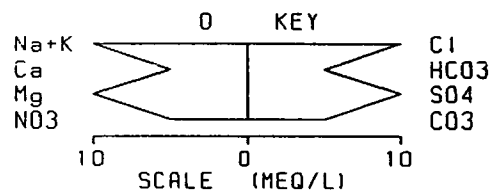
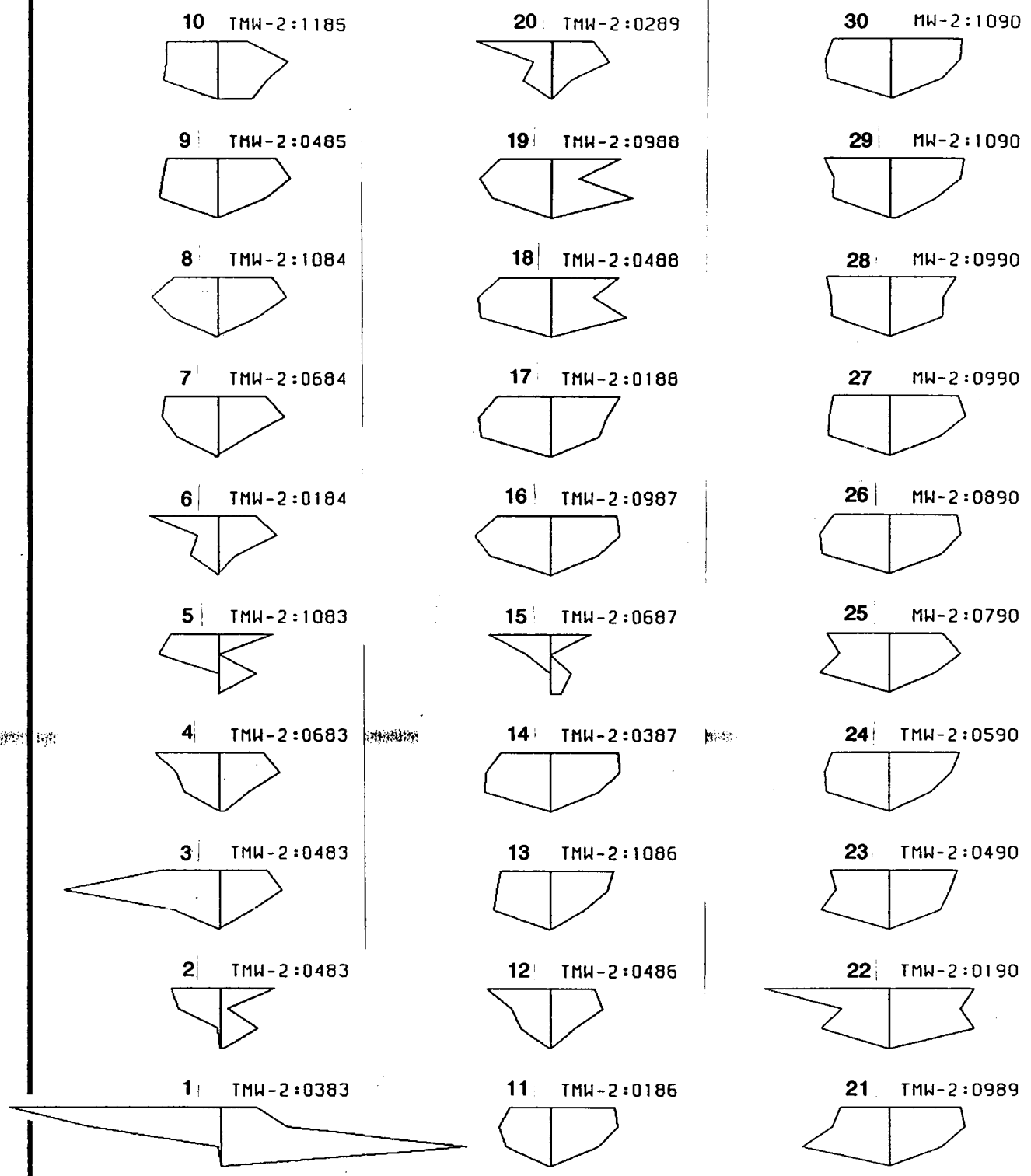
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34.5 27.8 37.7 28.6 36.4 36.3



# PIPER DIAGRAM TMW-2



FILE 16550-1002  
BY \_\_\_\_\_  
CHECKED BY \_\_\_\_\_  
DATE \_\_\_\_\_



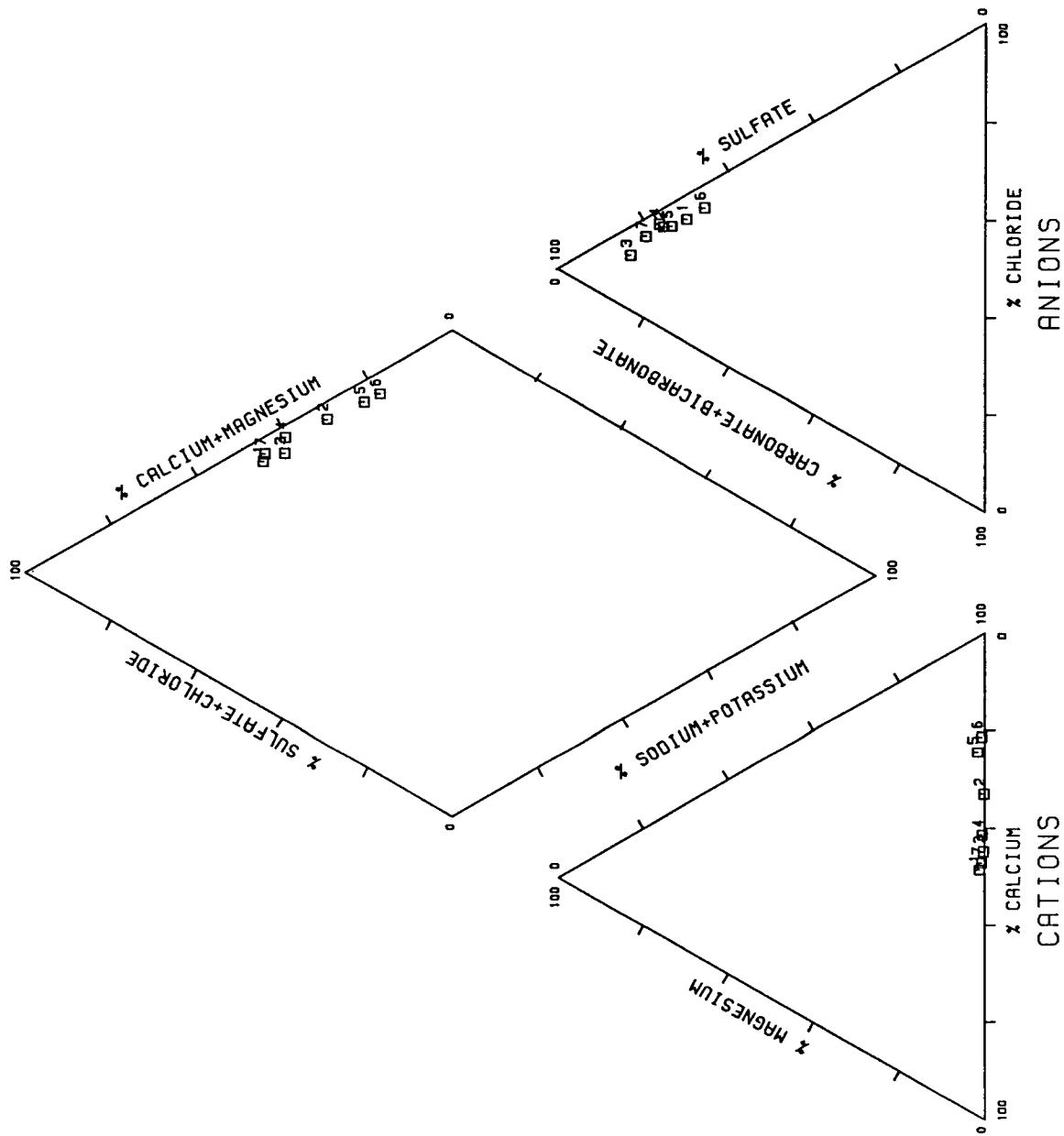
# STIFF DIAGRAM TMW-2

# PIPER DIAGRAM COORDINATES-IN PERCENT

| NO. | WELL  | Ca   | Mg  | K+Na | SO4  | Cl*  | CO3+HCO3 | ION<br>BALANCE | SYMBOL |
|-----|-------|------|-----|------|------|------|----------|----------------|--------|
| 1   | TPOND | 48.0 | 1.2 | 50.8 | 69.8 | 25.4 | 4.8      | -3.7           | 0      |
| 2   | TPOND | 32.9 | .2  | 66.9 | 75.3 | 21.1 | 3.6      | -4.5           | 0      |
| 3   | TPOND | 44.7 | .3  | 55.0 | 83.0 | 11.3 | 5.6      | -3.6           | 0      |
| 4   | TPOND | 41.1 | .5  | 58.3 | 76.4 | 21.1 | 2.5      | -5.4           | 0      |
| 5   | TPOND | 23.5 | 1.7 | 74.8 | 73.4 | 22.1 | 4.5      | -6.7           | 0      |
| 6   | TPOND | 21.0 | .7  | 78.3 | 65.6 | 29.8 | 4.6      | -10.0          | 0      |
| 7   | TPOND | 46.7 | .7  | 52.5 | 79.5 | 17.0 | 3.5      | -3.2           | 0      |

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 \*Cl INCLUDES NO3 AND F

SAMPLES:  
 □ 1 TPOND  
 □ 2 TPOND  
 □ 3 TPOND  
 □ 4 TPOND  
 □ 5 TPOND  
 □ 6 TPOND  
 □ 7 TPOND



# PIPER DIAGRAM TAILINGS POND



TABLE A-21

EXAMPLE DATA FROM EP17I EX1

PUMPING WELL NUMBER - MW-5  
 WELL RADIUS IN FEET - .21  
 PUMPING RATE IN GPM - 1.5

## DRAWDOWN DATA:

| TIME     | WATER LEVEL<br>(FEET) | TIME SINCE PUMPING<br>BEGAN (MINUTES) | DRAWDOWN<br>(FEET) |
|----------|-----------------------|---------------------------------------|--------------------|
| 12:48: 0 | 40.10                 |                                       |                    |
| 12:51: 0 | 40.30                 | 3.0                                   | .20                |
| 12:52:31 | 43.80                 | 4.5                                   | 3.70               |
| 12:53:30 | 44.50                 | 5.5                                   | 4.40               |
| 12:53:40 | 45.10                 | 5.7                                   | 5.00               |
| 12:53:51 | 45.70                 | 5.8                                   | 5.60               |
| 12:54: 2 | 46.15                 | 6.0                                   | 6.05               |
| 12:54: 8 | 46.50                 | 6.1                                   | 6.40               |
| 12:54:20 | 46.90                 | 6.3                                   | 6.80               |
| 12:55: 0 | 48.15                 | 7.0                                   | 8.05               |
| 12:56:20 | 49.20                 | 8.3                                   | 9.10               |
| 12:57:28 | 49.40                 | 9.5                                   | 9.30               |
| 12:58: 0 | 50.40                 | 10.0                                  | 10.30              |
| 13: 0: 0 | 49.53                 | 12.0                                  | 9.43               |
| 13: 0:37 | 49.10                 | 12.6                                  | 9.00               |
| 13: 3:20 | 48.35                 | 15.3                                  | 8.25               |
| 13: 4:32 | 48.57                 | 16.5                                  | 8.47               |
| 13: 5:21 | 48.60                 | 17.4                                  | 8.50               |
| 13: 8: 0 | 48.95                 | 20.0                                  | 8.85               |
| 13:10:20 | 49.35                 | 22.3                                  | 9.25               |
| 13:12:42 | 49.68                 | 24.7                                  | 9.58               |
| 13:16:12 | 50.20                 | 28.2                                  | 10.10              |
| 13:22:53 | 51.20                 | 34.9                                  | 11.10              |
| 13:37: 9 | 53.15                 | 49.2                                  | 13.05              |
| 13:52: 0 | 56.86                 | 64.0                                  | 16.76              |
| 13:53:40 | 56.92                 | 65.7                                  | 16.82              |
| 14: 0:15 | 55.48                 | 72.3                                  | 15.38              |
| 14: 3:28 | 54.78                 | 75.5                                  | 14.68              |
| 14:16:12 | 53.09                 | 88.2                                  | 12.99              |
| 14:23:40 | 52.74                 | 95.7                                  | 12.64              |
| 14:38:27 | 52.95                 | 110.4                                 | 12.85              |
| 14:55: 4 | 54.30                 | 127.1                                 | 14.20              |
| 15:11:28 | 56.40                 | 143.5                                 | 16.30              |
| 15:22:50 | 57.90                 | 154.8                                 | 17.80              |
| 15:34:37 | 58.55                 | 166.6                                 | 18.45              |
| 15:41:29 | 61.27                 | 173.5                                 | 21.17              |

## RECOVERY DATA:

| TIME     | WATER LEVEL<br>(FEET) | TIME SINCE PUMPING<br>BEGAN (MINUTES) | TIME SINCE PUMPING<br>CEASED (MINUTES) | RECOVERY<br>(FEET) | RESID DD<br>(FEET) | RATIO<br>T/T' |
|----------|-----------------------|---------------------------------------|--|--------------------|--------------------|---------------|
| 15:42:35 | 60.05                 | 174.6                                 | .0                                     | .00                | 19.95              | .0            |
| 15:42:57 | 59.70                 | 174.9                                 | .4                                     | .35                | 19.60              | 477.1         |

TABLE A-21 (Continued)

|          |       |        |        |       |       |       |
|----------|-------|--------|--------|-------|-------|-------|
| 15:43:38 | 58.30 | 175.6  | 1.1    | 1.75  | 18.20 | 167.3 |
| 15:43:54 | 57.85 | 175.9  | 1.3    | 2.20  | 17.75 | 133.6 |
| 15:44: 8 | 57.35 | 176.1  | 1.6    | 2.70  | 17.25 | 113.6 |
| 15:44:25 | 56.90 | 176.4  | 1.8    | 3.15  | 16.80 | 96.2  |
| 15:45: 3 | 55.90 | 177.1  | 2.5    | 4.15  | 15.80 | 71.8  |
| 15:45:27 | 55.30 | 177.4  | 2.9    | 4.75  | 15.20 | 61.9  |
| 15:45:50 | 54.90 | 177.8  | 3.3    | 5.15  | 14.80 | 54.7  |
| 15:46:45 | 53.65 | 178.8  | 4.2    | 6.40  | 13.55 | 42.9  |
| 15:47:50 | 52.60 | 179.8  | 5.3    | 7.45  | 12.50 | 34.3  |
| 15:49:10 | 51.70 | 181.2  | 6.6    | 8.35  | 11.60 | 27.5  |
| 15:50:58 | 50.65 | 183.0  | 8.4    | 9.40  | 10.55 | 21.8  |
| 15:52:25 | 50.05 | 184.4  | 9.8    | 10.00 | 9.95  | 18.8  |
| 15:53:29 | 49.75 | 185.5  | 10.9   | 10.30 | 9.65  | 17.0  |
| 15:54:53 | 49.25 | 186.9  | 12.3   | 10.80 | 9.15  | 15.2  |
| 16: 1:12 | 47.75 | 193.2  | 18.6   | 12.30 | 7.65  | 10.4  |
| 16:11:39 | 46.78 | 203.6  | 29.1   | 13.27 | 6.68  | 7.0   |
| 16:24:30 | 46.15 | 216.5  | 41.9   | 13.90 | 6.05  | 5.2   |
| 16:38:25 | 45.70 | 230.4  | 55.8   | 14.35 | 5.60  | 4.1   |
| 16:49:55 | 45.56 | 241.9  | 67.3   | 14.49 | 5.46  | 3.6   |
| 17:15:11 | 45.14 | 267.2  | 92.6   | 14.91 | 5.04  | 2.9   |
| 17:46:18 | 44.75 | 298.3  | 123.7  | 15.30 | 4.65  | 2.4   |
| 18:14:55 | 44.57 | 326.9  | 152.3  | 15.48 | 4.47  | 2.1   |
| 19:37:17 | 44.02 | 409.3  | 234.7  | 16.03 | 3.92  | 1.7   |
| 20:12: 7 | 43.86 | 444.1  | 269.5  | 16.19 | 3.76  | 1.6   |
| 20:39:54 | 43.72 | 471.9  | 297.3  | 16.33 | 3.62  | 1.6   |
| 21:11:50 | 43.62 | 503.8  | 329.3  | 16.43 | 3.52  | 1.5   |
| 8:38:52  | 42.44 | 1190.9 | 1016.3 | 17.61 | 2.34  | 1.2   |
| 9:41: 2  | 42.33 | 1253.0 | 1078.4 | 17.72 | 2.23  | 1.2   |

TABLE A-22

EXAMPLE DATA FROM EP17I

EX1

PUMPING WELL NUMBER - MW-7  
 WELL RADIUS IN FEET - .21  
 PUMPING RATE IN GPM - 2.2

## DRAWDOWN DATA:

| TIME     | WATER LEVEL<br>(FEET) | TIME SINCE PUMPING<br>BEGAN (MINUTES) | DRAWDOWN<br>(FEET) |
|----------|-----------------------|---------------------------------------|--------------------|
| 13:18:15 | 32.85                 |                                       |                    |
| 13:18:45 | 35.30                 | .5                                    | 2.45               |
| 13:19:27 | 35.45                 | 1.2                                   | 2.60               |
| 13:19:46 | 35.47                 | 1.5                                   | 2.62               |
| 13:20:20 | 35.62                 | 2.1                                   | 2.77               |
| 13:21: 4 | 36.27                 | 2.8                                   | 3.42               |
| 13:21:13 | 36.42                 | 3.0                                   | 3.57               |
| 13:21:21 | 36.65                 | 3.1                                   | 3.80               |
| 13:21:29 | 36.80                 | 3.2                                   | 3.95               |
| 13:21:39 | 37.19                 | 3.4                                   | 4.34               |
| 13:21:56 | 37.48                 | 3.7                                   | 4.63               |
| 13:22: 8 | 37.79                 | 3.9                                   | 4.94               |
| 13:22:32 | 38.19                 | 4.3                                   | 5.34               |
| 13:23:19 | 38.90                 | 5.1                                   | 6.05               |
| 13:23:50 | 39.35                 | 5.6                                   | 6.50               |
| 13:24:40 | 39.24                 | 6.4                                   | 6.39               |
| 13:25:12 | 39.22                 | 6.9                                   | 6.37               |
| 13:26:18 | 39.01                 | 8.1                                   | 6.16               |
| 13:26:24 | 38.95                 | 8.1                                   | 6.10               |
| 13:27:52 | 38.08                 | 9.6                                   | 5.23               |
| 13:28:12 | 37.85                 | 9.9                                   | 5.00               |
| 13:28:37 | 37.62                 | 10.4                                  | 4.77               |
| 13:29: 5 | 37.38                 | 10.8                                  | 4.53               |
| 13:29:42 | 37.14                 | 11.4                                  | 4.29               |
| 13:30:20 | 36.96                 | 12.1                                  | 4.11               |
| 13:30:43 | 36.82                 | 12.5                                  | 3.97               |
| 13:31:10 | 36.71                 | 12.9                                  | 3.86               |
| 13:31:38 | 36.56                 | 13.4                                  | 3.71               |
| 13:33: 2 | 36.27                 | 14.8                                  | 3.42               |
| 13:36:35 | 35.96                 | 18.3                                  | 3.11               |
| 13:41:50 | 35.30                 | 23.6                                  | 2.45               |
| 13:49:36 | 34.77                 | 31.4                                  | 1.92               |
| 13:57:43 | 34.72                 | 39.5                                  | 1.87               |
| 14: 5: 6 | 34.65                 | 46.8                                  | 1.80               |
| 14:12: 8 | 34.68                 | 53.9                                  | 1.83               |
| 14:20:15 | 34.64                 | 62.0                                  | 1.79               |
| 14:23:20 | 37.05                 | 65.1                                  | 4.20               |
| 14:24:10 | 37.95                 | 65.9                                  | 5.10               |
| 14:25: 8 | 38.62                 | 66.9                                  | 5.77               |
| 14:26:12 | 38.98                 | 67.9                                  | 6.13               |
| 14:27:41 | 39.55                 | 69.4                                  | 6.70               |
| 14:28:50 | 39.92                 | 70.6                                  | 7.07               |
| 14:32:20 | 40.45                 | 74.1                                  | 7.60               |
| 14:34: 0 | 42.08                 | 75.8                                  | 9.23               |

TABLE A-22 (Continued)

|          |       |       |       |
|----------|-------|-------|-------|
| 14:35: 1 | 43.25 | 76.8  | 10.40 |
| 14:36: 0 | 43.91 | 77.8  | 11.06 |
| 14:37: 5 | 44.56 | 78.8  | 11.71 |
| 14:38:11 | 45.20 | 79.9  | 12.35 |
| 14:39: 8 | 45.64 | 80.9  | 12.79 |
| 14:40:18 | 46.15 | 82.1  | 13.30 |
| 14:41:37 | 46.60 | 83.4  | 13.75 |
| 14:44:35 | 47.45 | 86.3  | 14.60 |
| 14:50: 8 | 48.50 | 91.9  | 15.65 |
| 14:53:48 | 48.92 | 95.6  | 16.07 |
| 15: 0: 3 | 49.59 | 101.8 | 16.74 |
| 15: 6: 8 | 50.25 | 107.9 | 17.40 |
| 15:11:46 | 50.12 | 113.5 | 17.27 |
| 15:18:42 | 49.40 | 120.4 | 16.55 |
| 15:22: 3 | 49.05 | 123.8 | 16.20 |
| 15:30:32 | 49.78 | 132.3 | 16.93 |
| 15:35: 5 | 50.02 | 136.8 | 17.17 |
| 15:41:45 | 50.22 | 143.5 | 17.37 |
| 15:45:50 | 50.42 | 147.6 | 17.57 |
| 15:53:10 | 50.94 | 154.9 | 18.09 |
| 16: 1:11 | 50.45 | 162.9 | 17.60 |
| 16: 5: 8 | 49.85 | 166.9 | 17.00 |
| 16:10:18 | 49.56 | 172.1 | 16.71 |
| 16:14:50 | 49.48 | 176.6 | 16.63 |

## RECOVERY DATA:

| TIME     | WATER LEVEL<br>(FEET) | TIME SINCE PUMPING<br>BEGAN (MINUTES) | TIME SINCE PUMPING<br>CEASED (MINUTES) | RECOVERY<br>(FEET) | RESID DD<br>(FEET) | RATIO<br>T/T' |
|----------|-----------------------|---------------------------------------|--|--------------------|--------------------|---------------|
| 16:15:12 | 48.50                 | 176.9                                 | .0                                     | .00                | 15.65              | .0            |
| 16:15:22 | 48.10                 | 177.1                                 | .2                                     | .40                | 15.25              | 1062.7        |
| 16:15:27 | 47.55                 | 177.2                                 | .3                                     | .95                | 14.70              | 708.8         |
| 16:15:40 | 46.95                 | 177.4                                 | .5                                     | 1.55               | 14.10              | 380.2         |
| 16:15:47 | 46.21                 | 177.5                                 | .6                                     | 2.29               | 13.36              | 304.3         |
| 16:15:56 | 45.68                 | 177.7                                 | .7                                     | 2.82               | 12.83              | 242.3         |
| 16:16: 3 | 45.31                 | 177.8                                 | .9                                     | 3.19               | 12.46              | 209.2         |
| 16:16:15 | 44.45                 | 178.0                                 | 1.1                                    | 4.05               | 11.60              | 169.5         |
| 16:16:24 | 44.08                 | 178.1                                 | 1.2                                    | 4.42               | 11.23              | 148.5         |
| 16:16:32 | 43.72                 | 178.3                                 | 1.3                                    | 4.78               | 10.87              | 133.7         |
| 16:16:38 | 43.21                 | 178.4                                 | 1.4                                    | 5.29               | 10.36              | 124.5         |
| 16:16:47 | 43.01                 | 178.5                                 | 1.6                                    | 5.49               | 10.16              | 112.8         |
| 16:16:54 | 42.68                 | 178.6                                 | 1.7                                    | 5.82               | 9.83               | 105.1         |
| 16:17: 2 | 42.35                 | 178.8                                 | 1.8                                    | 6.15               | 9.50               | 97.5          |
| 16:17:10 | 41.96                 | 178.9                                 | 2.0                                    | 6.54               | 9.11               | 91.0          |
| 16:17:17 | 41.66                 | 179.0                                 | 2.1                                    | 6.84               | 8.81               | 85.9          |
| 16:17:29 | 41.37                 | 179.2                                 | 2.3                                    | 7.13               | 8.52               | 78.5          |
| 16:17:39 | 40.99                 | 179.4                                 | 2.4                                    | 7.51               | 8.14               | 73.2          |
| 16:18:41 | 39.48                 | 180.4                                 | 3.5                                    | 9.02               | 6.63               | 51.8          |
| 16:19: 3 | 39.12                 | 180.8                                 | 3.9                                    | 9.38               | 6.27               | 47.0          |
| 16:19:29 | 38.75                 | 181.2                                 | 4.3                                    | 9.75               | 5.90               | 42.3          |
| 16:20: 0 | 38.21                 | 181.8                                 | 4.8                                    | 10.29              | 5.36               | 37.9          |
| 16:20:44 | 37.85                 | 182.5                                 | 5.5                                    | 10.65              | 5.00               | 33.0          |
| 16:21:11 | 37.51                 | 182.9                                 | 6.0                                    | 10.99              | 4.66               | 30.6          |
| 16:22: 9 | 37.01                 | 183.9                                 | 6.9                                    | 11.49              | 4.16               | 26.5          |
| 16:22:48 | 36.71                 | 184.6                                 | 7.6                                    | 11.79              | 3.86               | 24.3          |
| 16:23:18 | 36.56                 | 185.1                                 | 8.1                                    | 11.94              | 3.71               | 22.8          |
| 16:30: 7 | 34.62                 | 191.9                                 | 14.9                                   | 13.88              | 1.77               | 12.9          |
| 16:38:35 | 34.05                 | 200.3                                 | 23.4                                   | 14.45              | 1.20               | 8.6           |
| 16:47:15 | 33.68                 | 209.0                                 | 32.1                                   | 14.82              | .83                | 6.5           |



TABLE A-22 (Continued)

|          |       |       |       |       |      |     |
|----------|-------|-------|-------|-------|------|-----|
| 17: 7:10 | 33.50 | 228.9 | 52.0  | 15.00 | .65  | 4.4 |
| 17:36:32 | 33.11 | 258.3 | 81.3  | 15.39 | .26  | 3.2 |
| 18: 5:19 | 33.01 | 287.1 | 110.1 | 15.49 | .16  | 2.6 |
| 18:31:40 | 32.86 | 313.4 | 136.5 | 15.64 | .01  | 2.3 |
| 19: 3:42 | 32.76 | 345.5 | 168.5 | 15.74 | -.09 | 2.1 |
| 19:35:11 | 32.61 | 376.9 | 200.0 | 15.89 | -.24 | 1.9 |

TABLE A-23

## DATA FROM MW-9 PUMPTEST

PUMPING WELL NUMBER - MW-9  
 WELL RADIUS IN FEET - .21  
 PUMPING RATE IN GPM - 2.60

## DRAWDOWN DATA:

| TIME     | WATER LEVEL<br>(FEET) | TIME SINCE PUMPING<br>BEGAN (MINUTES) | DRAWDOWN<br>(FEET) |
|----------|-----------------------|---------------------------------------|--------------------|
| 12:55:18 | 903.36                |                                       |                    |
| 12:55:30 | 905.00                | .2                                    | 1.64               |
| 12:55:34 | 906.00                | .3                                    | 2.64               |
| 12:55:45 | 907.00                | .5                                    | 3.64               |
| 12:56: 0 | 909.00                | .7                                    | 5.64               |
| 12:56: 6 | 910.00                | .8                                    | 6.64               |
| 12:56:15 | 911.00                | 1.0                                   | 7.64               |
| 12:56:23 | 912.00                | 1.1                                   | 8.64               |
| 12:56:32 | 913.00                | 1.2                                   | 9.64               |
| 12:56:55 | 915.00                | 1.6                                   | 11.64              |
| 12:57:11 | 917.00                | 1.9                                   | 13.64              |
| 12:57:22 | 918.00                | 2.1                                   | 14.64              |
| 12:57:33 | 919.00                | 2.3                                   | 15.64              |
| 12:57:44 | 920.00                | 2.4                                   | 16.64              |
| 12:57:56 | 921.00                | 2.6                                   | 17.64              |
| 12:58: 8 | 922.00                | 2.8                                   | 18.64              |
| 12:58:23 | 923.00                | 3.1                                   | 19.64              |
| 12:58:37 | 924.00                | 3.3                                   | 20.64              |
| 12:58:51 | 925.00                | 3.6                                   | 21.64              |
| 12:59: 6 | 926.00                | 3.8                                   | 22.64              |
| 12:59:25 | 927.00                | 4.1                                   | 23.64              |
| 12:59:43 | 928.00                | 4.4                                   | 24.64              |
| 12:59:55 | 929.00                | 4.6                                   | 25.64              |
| 13: 0:21 | 930.00                | 5.1                                   | 26.64              |
| 13: 0:43 | 931.00                | 5.4                                   | 27.64              |
| 13: 1: 5 | 932.00                | 5.8                                   | 28.64              |
| 13: 1:29 | 933.00                | 6.2                                   | 29.64              |
| 13: 1:55 | 934.00                | 6.6                                   | 30.64              |
| 13: 2:27 | 935.00                | 7.2                                   | 31.64              |
| 13: 3: 2 | 936.00                | 7.7                                   | 32.64              |
| 13: 3:42 | 937.00                | 8.4                                   | 33.64              |
| 13: 4:29 | 938.00                | 9.2                                   | 34.64              |
| 13: 5:42 | 939.00                | 10.4                                  | 35.64              |
| 13:20: 1 | 939.52                | 24.7                                  | 36.16              |
| 13:29:43 | 941.72                | 34.4                                  | 38.36              |
| 13:57:35 | 948.51                | 62.3                                  | 45.15              |
| 15: 8:30 | 959.78                | 133.2                                 | 56.42              |
| 16: 7: 0 | 969.36                | 191.7                                 | 66.00              |
| 16:59:55 | 974.43                | 244.6                                 | 71.07              |
| 18:14:35 | 978.82                | 319.3                                 | 75.46              |
| 19:11:56 | 981.23                | 376.6                                 | 77.87              |

## RECOVERY DATA:

TABLE A-23 (Continued)

| TIME     | WATER LEVEL<br>(FEET) | TIME SINCE PUMPING<br>BEGAN (MINUTES) | TIME SINCE PUMPING<br>CEASED (MINUTES) | RECOVERY<br>(FEET) | RESID DD<br>(FEET) | RATIO<br>T/T' |
|----------|-----------------------|---------------------------------------|--|--------------------|--------------------|---------------|
| 19:13:30 | 978.00                | 378.2                                 | .0                                     | .00                | 74.64              | .0            |
| 19:13:39 | 977.00                | 378.4                                 | .1                                     | 1.00               | 73.64              | 2522.4        |
| 19:13:47 | 976.00                | 378.5                                 | .3                                     | 2.00               | 72.64              | 1335.9        |
| 19:14:14 | 974.00                | 378.9                                 | .7                                     | 4.00               | 70.64              | 516.7         |
| 19:14:24 | 973.00                | 379.1                                 | .9                                     | 5.00               | 69.64              | 421.2         |
| 19:14:36 | 972.00                | 379.3                                 | 1.1                                    | 6.00               | 68.64              | 344.8         |
| 19:15:23 | 969.00                | 380.1                                 | 1.9                                    | 9.00               | 65.64              | 201.8         |
| 19:15:39 | 968.00                | 380.4                                 | 2.1                                    | 10.00              | 64.64              | 176.9         |
| 19:15:53 | 967.00                | 380.6                                 | 2.4                                    | 11.00              | 63.64              | 159.7         |
| 19:16:13 | 966.00                | 380.9                                 | 2.7                                    | 12.00              | 62.64              | 140.2         |
| 19:16:31 | 965.00                | 381.2                                 | 3.0                                    | 13.00              | 61.64              | 126.4         |
| 19:16:49 | 964.00                | 381.5                                 | 3.3                                    | 14.00              | 60.64              | 115.0         |
| 19:17:10 | 963.00                | 381.9                                 | 3.7                                    | 15.00              | 59.64              | 104.1         |
| 19:17:27 | 962.00                | 382.2                                 | 4.0                                    | 16.00              | 58.64              | 96.7          |
| 19:17:45 | 961.00                | 382.5                                 | 4.3                                    | 17.00              | 57.64              | 90.0          |
| 19:18: 1 | 960.00                | 382.7                                 | 4.5                                    | 18.00              | 56.64              | 84.7          |
| 19:18:21 | 959.00                | 383.1                                 | 4.9                                    | 19.00              | 55.64              | 79.0          |
| 19:18:41 | 958.00                | 383.4                                 | 5.2                                    | 20.00              | 54.64              | 74.0          |
| 19:19: 3 | 957.00                | 383.8                                 | 5.5                                    | 21.00              | 53.64              | 69.1          |
| 19:19:26 | 956.00                | 384.1                                 | 5.9                                    | 22.00              | 52.64              | 64.7          |
| 19:19:48 | 955.00                | 384.5                                 | 6.3                                    | 23.00              | 51.64              | 61.0          |
| 19:20:13 | 954.00                | 384.9                                 | 6.7                                    | 24.00              | 50.64              | 57.3          |
| 19:20:37 | 953.00                | 385.3                                 | 7.1                                    | 25.00              | 49.64              | 54.1          |
| 19:21: 3 | 952.00                | 385.8                                 | 7.5                                    | 26.00              | 48.64              | 51.1          |
| 19:21:30 | 951.00                | 386.2                                 | 8.0                                    | 27.00              | 47.64              | 48.3          |
| 19:21:59 | 950.00                | 386.7                                 | 8.5                                    | 28.00              | 46.64              | 45.6          |
| 19:22:29 | 949.00                | 387.2                                 | 9.0                                    | 29.00              | 45.64              | 43.1          |
| 19:22:58 | 948.00                | 387.7                                 | 9.5                                    | 30.00              | 44.64              | 41.0          |
| 19:23:33 | 947.00                | 388.3                                 | 10.0                                   | 31.00              | 43.64              | 38.6          |
| 19:24: 7 | 946.00                | 388.8                                 | 10.6                                   | 32.00              | 42.64              | 36.6          |
| 19:24:41 | 945.00                | 389.4                                 | 11.2                                   | 33.00              | 41.64              | 34.8          |
| 19:25:16 | 944.00                | 390.0                                 | 11.8                                   | 34.00              | 40.64              | 33.1          |
| 19:25:55 | 943.00                | 390.6                                 | 12.4                                   | 35.00              | 39.64              | 31.5          |
| 19:26:35 | 942.00                | 391.3                                 | 13.1                                   | 36.00              | 38.64              | 29.9          |
| 19:27:13 | 941.00                | 391.9                                 | 13.7                                   | 37.00              | 37.64              | 28.6          |
| 19:27:50 | 940.00                | 392.5                                 | 14.3                                   | 38.00              | 36.64              | 27.4          |
| 19:28:33 | 939.00                | 393.3                                 | 15.0                                   | 39.00              | 35.64              | 26.1          |
| 19:29:24 | 938.00                | 394.1                                 | 15.9                                   | 40.00              | 34.64              | 24.8          |
| 19:30: 1 | 937.00                | 394.7                                 | 16.5                                   | 41.00              | 33.64              | 23.9          |
| 19:30:52 | 936.00                | 395.6                                 | 17.4                                   | 42.00              | 32.64              | 22.8          |
| 19:31:49 | 935.00                | 396.5                                 | 18.3                                   | 43.00              | 31.64              | 21.6          |
| 19:32:43 | 934.00                | 397.4                                 | 19.2                                   | 44.00              | 30.64              | 20.7          |
| 19:33:42 | 933.00                | 398.4                                 | 20.2                                   | 45.00              | 29.64              | 19.7          |
| 19:34:46 | 932.00                | 399.5                                 | 21.3                                   | 46.00              | 28.64              | 18.8          |
| 19:35:53 | 931.00                | 400.6                                 | 22.4                                   | 47.00              | 27.64              | 17.9          |
| 19:36:57 | 930.00                | 401.7                                 | 23.5                                   | 48.00              | 26.64              | 17.1          |
| 19:43:53 | 925.00                | 408.6                                 | 30.4                                   | 53.00              | 21.64              | 13.4          |
| 19:54:19 | 920.00                | 419.0                                 | 40.8                                   | 58.00              | 16.64              | 10.3          |
| 20: 8: 7 | 915.00                | 432.8                                 | 54.6                                   | 63.00              | 11.64              | 7.9           |
| 20:17:51 | 912.00                | 442.6                                 | 64.4                                   | 66.00              | 8.64               | 6.9           |

TABLE A-25

SUMMARY OF AQUIFER TEST RESULTS

| Well | Screened Depth<br>(ft) | Static Water<br>Level Depth*<br>(ft) | Average<br>Pumping<br>Rate<br>(gpm) | Specific<br>Capacity<br>(gpm/ft) | Transmissivity<br>(gpd/ft) | Method** | Aquifer<br>Thickness<br>(ft) | Permeability<br>(ft/yr) |
|------|------------------------|--------------------------------------|-------------------------------------|----------------------------------|----------------------------|----------|------------------------------|-------------------------|
| MW-5 | 46.5 - 66.5            | 39.25                                | 1.5                                 | 0.05                             | 46<br>44                   | P<br>R   | 21                           | 107<br>102              |
| MW-7 | 47.8 - 67.8            | 31.86                                | 2.2                                 | 0.16                             | 62<br>61                   | P<br>R   | 13                           | 230<br>226              |
| MW-8 | 247.2 - 300.0          | 286.25                               | -                                   | -                                | 4                          | H        | 5                            | 39                      |
| MW-9 | 1131.3 - 1205.5        | 902.36                               | 2.6                                 | 0.03                             | 16<br>16                   | P<br>R   | 30                           | 26<br>26                |

\* Depth below top casing

\*\* Method

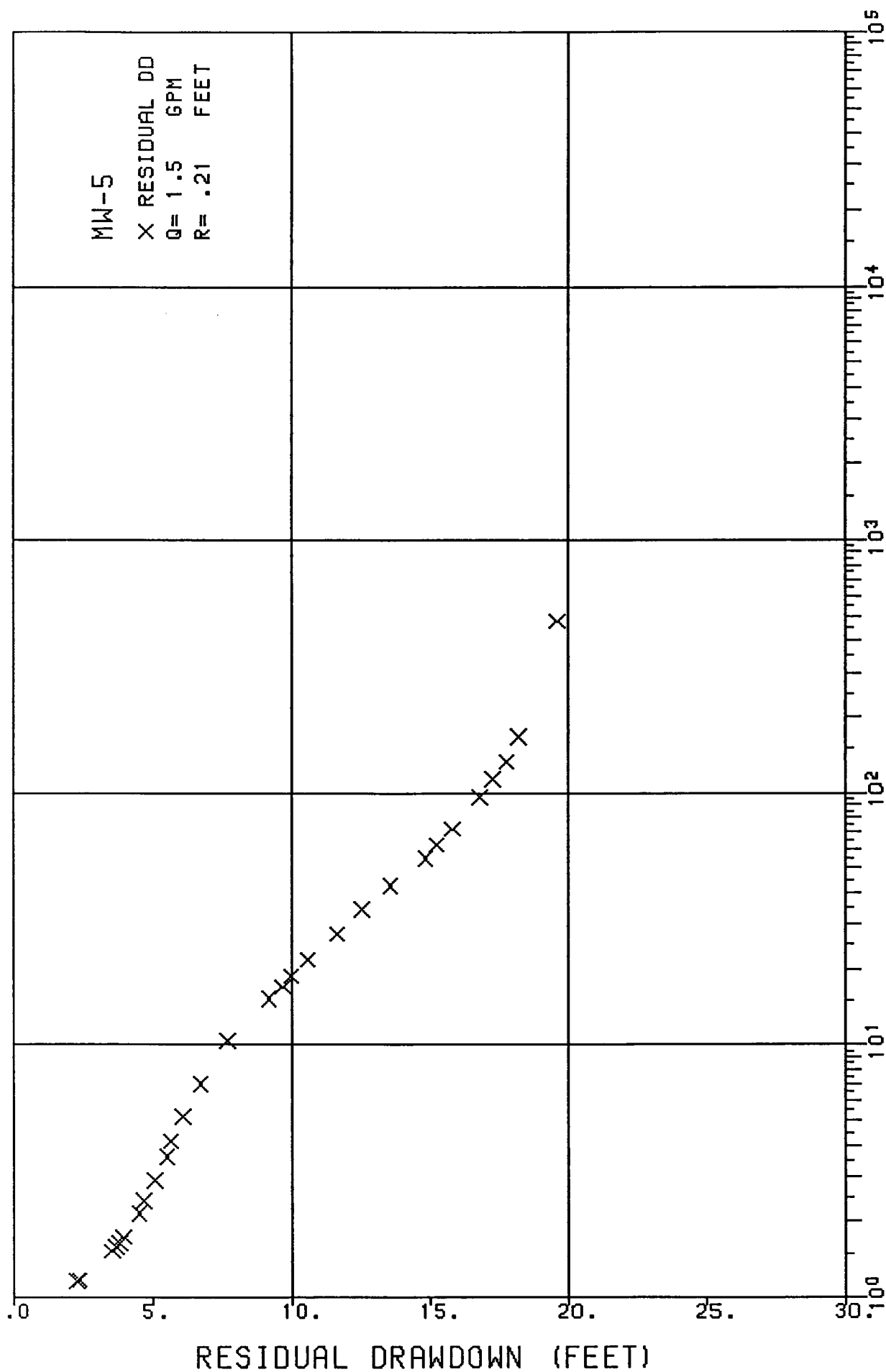
P - Analysis of pumping drawdown versus log-time

R - Analysis of recovery drawdown versus log-time

H - Analysis of head ratio versus log-time

Test of MW-5 From EXAMPL1.DAT  
FRI 01-11-1991 12:53:51.92

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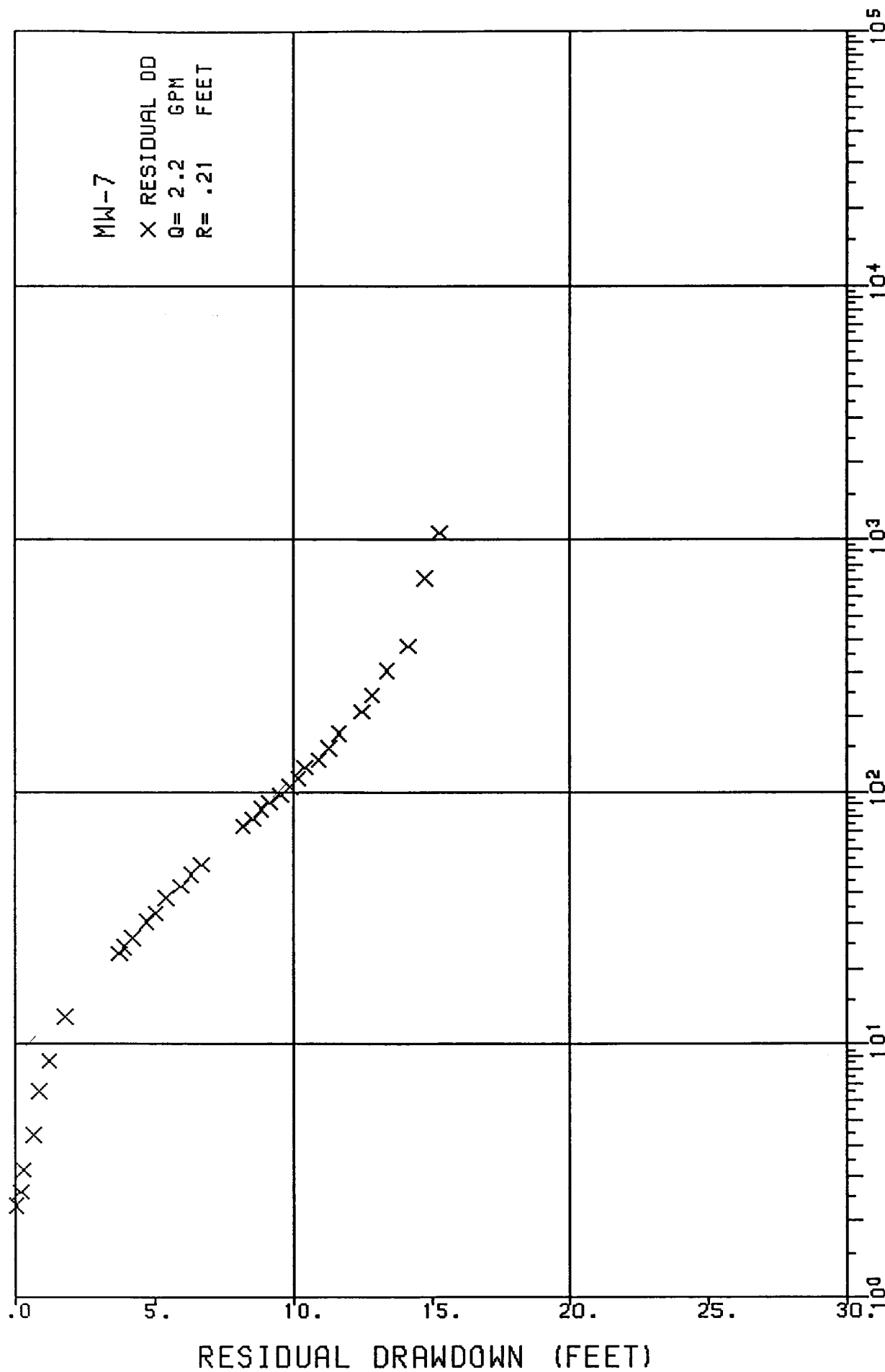


PLOT OF RESIDUAL DRAWDOWN VS T/T



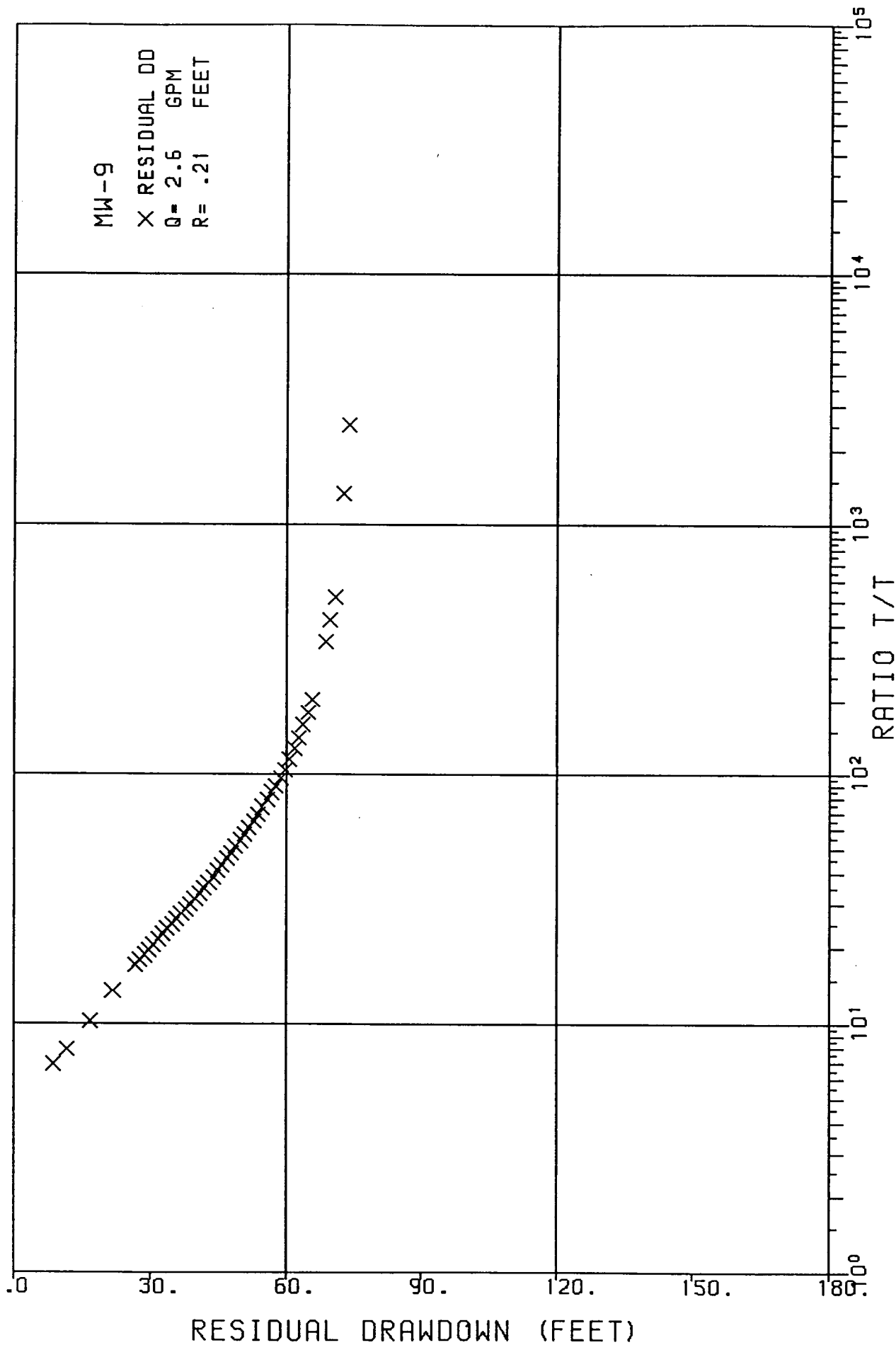
Test of MW-7 From EXAMPL1.DAT  
FRI 01-11-1991 12:59:51.74

Dennis & Moore



RATIO  $T/T'$   
PLOT OF RESIDUAL DRAWDOWN VS  $T/T'$

Test of DDN From MW-9 PUMP TEST  
TUE 01-08-1991 17:34:25.16 Dames & Moore



PLOT OF RESIDUAL DRAWDOWN VS T/T